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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,217	12/11/2003	Axel Brintzinger	2002 P 12234 US	8003
48154	7590	04/20/2006	EXAMINER	
SLATER & MATSIL LLP 17950 PRESTON ROAD SUITE 1000 DALLAS, TX 75252			THOMAS, TONIAE M	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 04/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/733,217

Applicant(s)

BRINTZINGER ET AL.

Examiner

Toniae M. Thomas

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,4,6,7 and 9-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4,6,9-14 and 16-22 is/are rejected.
- 7) ☒ Claim(s) 3,7 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office action is responsive to the amendment filed on 31 January 2006.
2. Currently, claims 3, 4, 6, 7, and 9-22 are pending.
3. The indicated allowability of claims 13-22 is withdrawn in view of the newly discovered reference to Eldridge et al. (US 2006/0019027). A rejection based on the newly cited reference follows.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. *Claims 4, 9-14, and 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eldridge et al. (US 2006,0019027 A1) in view of Klocke et al. (US 2003/0057093 A1).*¹

The Eldridge et al. application publication (Eldridge) discloses a method of forming a plurality of three-dimensional structures on a substrate (see figs. 2A-2H and accompanying text). The method comprises the steps of: providing a wafer 32 with bumps 30 distributed on a surface of the wafer (fig. 2C and par. 0058, lines 1-7); and forming a photoresist 54 over the surface including

Art Unit: 2822

the bumps (fig. 2E and par. 0067, lines 1-4). Eldridge teaches that the photoresist 54 may be an electrophoretic resist (par. 0067, lines 4-7).

Eldridge further discloses patterning the photoresist 54 to expose a seed layer 52 (fig. 2F and par. 0069, lines 1-3), and forming a plurality of conductors 58 over the exposed seed layer (fig. 2G and par. 0069, lines 7-11).

As explained above, Eldridge discloses forming a photoresist 54 over the wafer surface including bumps 30, wherein the photoresist can be an electrophoretic resist. While Eldridge discloses forming an electrophoretic resist pattern over the wafer surface, Eldridge does not explicitly teach forming the electrophoretic resist by: dipping the surface of the wafer into the electrophoretic resist; and applying an electrical voltage between the wafer and the electrophoretic resist.

The Klocke et al. application publication discloses a method of depositing an electrophoretic resist on microelectronic workpieces (par. 9, lines 10-14). The electrophoretic resist is formed by: placing a workpiece into an electrophoretic resist; applying an electrical voltage between the substrate and the electrophoretic resist, while the workpiece is in the electrophoretic resist; and subsequently removing the workpiece from the electrophoretic resist (fig. 17; par. 091, lines 1-19; and par. 0111, lines 1-3). In one embodiment, the method further comprises protecting the rear surface of a workpiece from wetting while the workpiece is placed in the electrophoretic resist (par. 0033,

¹ The Klocke et al. patent was relied upon in the previous Office action mailed on 17 November

lines 12-18 and par. 48, lines 13-19). In one embodiment, the method further comprises causing the workpiece to be moved relative to the electrophoretic resist while the workpiece is placed in the electrophoretic resist (par. 0049, 1-5; par. 0051, 1-5; and par. 0091, lines 9-19). The workpiece is rotated while the workpiece is placed in the electrophoretic resist (par. 0049, lines 1-5; par. 0051, lines 1-5; and par. 0091, lines 9-19). In one embodiment, the electrophoretic resist is stirred while the workpiece is placed in the electrophoretic resist (par. 0049, lines 5-6). The surface of the wafer is dipped into the electrophoretic resist in a horizontal arrangement of the wafer (fig. 2 and par. 0079). The method further comprises heating the workpiece after removing the workpiece from the electrophoretic resist (par. 112, lines 8- 18).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to form the electrophoretic resist by the method comprising placing a workpiece into an electrophoretic resist, applying an electrical voltage between the substrate and the electrophoretic resist while the workpiece is in the electrophoretic resist, and subsequently removing the workpiece from the electrophoretic resist, as taught by Klocke, because this method is known in the art.

5. *Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eldridge et al. (US 2006/0019027 A1) in view of Klocke et al. (US 2003/0057093*

A1) as applied to claims 13 and 14 above, and further in view of Brooks et al. (US 6,084,297).²

As explained above, Eldridge discloses forming a plurality of conductors 58 over the exposed seed layer (par. 0069, lines 7-11). The plurality of conductors may comprise a gold layer formed over a nickel layer (par. 0070, lines 12-18).

The Brooks et al. patent (Brooks) discloses forming a plurality of conductors 32 (fig. 1 and col. 5, lines 46-49). The plurality of conductors comprises a copper layer, a nickel layer formed over the copper layer, and a gold layer formed over the nickel layer (col. 5, lines 50-53).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to form the nickel layer over a copper layer, as taught by Brooks, since copper has excellent conductivity.

Allowable Subject Matter

6. Claims 3, 7, and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on (571) 272-2429. The

² The Brooks et al. patent was relied upon in the previous Office action mailed on 17 November 2005.

Art Unit: 2822

fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMT

14 May 2005

A handwritten signature in black ink, appearing to read 'Mary Wilczewski', with a stylized flourish at the end.

Mary Wilczewski
Primary Examiner